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ABSTRACT

Many scholars have made recommendations about how to improve content area materials and instruction, but the recommendations have been made apart from the study of existing content area materials and instruction. A review of detailed studies describing elementary and secondary content area materials and the extent of their use indicate that: reliance upon a single textbook is characteristic of all subject areas in American public schools, regardless of grade level; elementary and secondary textbooks are characterized by the "inconsiderate" nature of the writing they contain; and the questions provided in the textbooks are largely lower level, asking for recall of information. Detailed studies describing teaching and learning in the content areas indicate that classroom interactions are restricted to the classic triad--teacher initiates a question, student responds, and teacher comments--and turn-taking pattern of classroom interaction. Among implications of these studies for practice are that: teachers should use multiple secondary materials; publishers should reduce the number of questions in commercially produced textbooks; students should be given more opportunity to write extended answers to questions; teachers should prepare students for the text materials they will read; and teachers should include instructional assignments that encompass more than the acquisition of discrete bits of information. Recommendations for future descriptive research call for: development and implementation of a large-scale effort to describe content area reading practices; analysis of questions in textbooks across content areas and grades; and examination of how reading is perceived to fit within the larger purpose of a particular content domain. (Fifty-nine references are attached.) (RS)

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AN EXISTENTIAL DESCRIPTION OF READING METHODS AND MATERIALS IN THE CONTENT AREAS

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September 1992

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Abstract

To foreground the conditions that exist in many schools that impede or facilitate the implementation of new content area reading materials or instructional practices, this report synthesizes studies that have described such materials and practices at both the elementary and secondary school levels. The report concludes with a discussion of implications of the research findings for publishers, teachers, and researchers.

AN EXISTENTIAL DESCRIPTION OF READING METHODS AND MATERIALS IN THE CONTENT AREAS

Beginning as early as the 1930s (McCallister, 1936) and continuing through the 1980s, many scholars have made recommendations about how to improve content area materials and instruction. To a large extent, however, these recommendations for improvement have been made apart from the study of existing content area materials and instruction. One only has to peruse the literature of the last half century to see how little research attention has been paid (until very recently) to describing systematically what content area textbooks are like and how teachers and students are using them. In sum, recommendations for improvement have been made without an understanding of the context in which they were to be implemented.

One remedy for this malady is to adopt a mindset for ecologically valid considerations. Gallagher, Goudvis, and Pearson (1988) call this the "context sensitive orientation to knowledge utilization" (p. 18). Obviously, recommendations that are made in the light of existing conditions stand a better chance of survival. A testament to such contextual knowledge sensitivity is the collaborative effort of Santa and content area teachers in Kalispell, Montana (Santa, 1988), in which the examination of classroom practices was essential in bringing about and maintaining meaningful and lasting improvement. Likewise, a profile is needed in the larger arena of content area reading so that suggestions for change can be made that are compatible with the existing system, and so that those suggestions that are incompatible will not be imposed on educators.

Our purpose in this report is to synthesize and discuss implications of those studies that have described the role of reading as it exists in content area materials and classrooms. We begin by describing the procedures used to locate descriptive studies of content area reading. Then, we examine the materials used in the content areas and the teaching and learning that have been observed by researchers and reported by teachers and students in content area classrooms. The result is a profile of the role of reading in the content areas at both the elementary (Grades 1-6) and secondary (Grades 7-12) levels. Finally, we discuss the implications of this profile for practice and future descriptive research.

Procedures

To locate studies that described some aspect of reading in the content areas, we made a thorough search of periodical guides and related resources (e.g., ERIC, the annual *Summary of Investigations Related to Reading*, conference programs of major professional associations). In addition, we used the reference sections of articles to locate many other studies. We found that the studies fell into two general categories: those that examined materials and those that examined teaching and learning. Within each of these categories were various sub-categories.

An Existential Description of Content Area Reading

Pearson and Gallagher (1983) define *existential* descriptions as those studies conducted to describe instruction and/or materials as they exist in schools. Put another way, existential descriptions propose to answer questions about what is going on in the real world of classrooms and instructional materials. Pearson and Gallagher say that these studies "serve a useful function to [those] who may wish ultimately to change the real world because they provide a benchmark for evaluating the worth and potential of any positive . . . finding" (p. 2). They argue that, in principle, such descriptions "remain neutral with respect to evaluating whether what exists is bad or good. Few, however, achieve such neutrality; and even if they do, they are seldom interpreted by others with neutrality" (p. 5). The purpose of this section is to provide an existential description of materials and of teaching and learning in the content areas.

Materials

Detailed studies describing content area materials and the extent of their use have only recently emerged (Squire, 1987). While there are some obvious content differences between elementary and secondary materials, for the most part, these materials have much in common. For example, reliance upon a single textbook has become a defining characteristic of all subject areas in American public schools, regardless of grade level. According to EPIE (1977), textbooks are used for 65% of classroom instructional time from Kindergarten through Grade 12. Goodlad (1976, 1984) found textbooks to be the main medium of instruction, with dependence on them increasing with grade level. Another shared characteristic of elementary and secondary textbooks is the *inconsiderate* nature of the writing they contain (Armbruster, 1984). Kantor, Anderson, and Armbruster (1983) described the treatment of topics in textbooks as superficial and disconnected. Calfee (1987) and Chambliss (1987a, 1987b) characterized textbooks at all levels as poorly organized, and Chall (1977) found the content and difficulty of textbooks to have been steadily "watered down" since the 1950s. Ironically, Goodlad (1983, 1984) observed that the very textbooks designed to present and discuss topics of high human interest bored students. In addition, the questions provided in both the teachers' manuals and student textbooks were largely lower level, asking students to recall facts and bits of unrelated information from the text.

While these generalizations characterize content area materials used in both elementary and secondary classrooms, it is worthwhile to note those studies that have examined materials specifically at the elementary and at the secondary level.

Elementary materials. Several studies have shown that in elementary schools, the textbook accounts for as much as 90% of the teaching time during social studies (Shaver, Davis, & Helburn, 1980; Woodward, Elliott, & Nagel, 1986). Davis, Frymier, and Clinefelter (cited in Komiski, 1978) reported that 78% of curriculum interactions in fifth-grade classrooms were with content textbooks.

The *inconsiderate* nature of the writing in elementary content area textbooks was found to be widespread. Kantor et al. (1983) concluded that social studies textbooks

1. provided no connection linking one statement/event to another,
2. offered no point of view,
3. avoided difficult vocabulary, and
4. omitted connectives and events that would have allowed students to make sense of the passages.

Along this same line, Tyson-Bernstein and Woodward (1986) found that elementary social studies textbooks gave bland, homogeneous, and insufficient treatment of most topics.

The most comprehensive examination of the content and writing in elementary materials to date is by Elliott, Carter Nagel, and Woodward (1985), who analyzed 10 published basal social studies series. They found that the textbooks were of high technical quality, with superior layout and graphics, but that the content, presentation, and scope and sequence of the materials were laden with problems. They described the social studies textbooks as "very much like the travelogues that adorn the coffee tables of many households. On the surface, the texts appear to be attractive, enticing, and excellent learning tools; beneath the surface they leave much to be desired as high quality and comprehensive instructional materials" (p. 2).

In addition, Elliott et al. (1985) observed that social studies *series* were not really series at all, but collections of loosely related volumes. To further strengthen the illusion of being a series, the textbooks in the collection were cloaked in a web of low-level skills giving the effect of continuity and comprehensiveness. Within each series, they found wide breadth but lack of depth in topic treatment.

They concluded that textbook series may be adequate as overviews or outlines, but not for preparing students for meaningful citizenship and critical scholarship.

In research that examined the extent to which text structures existed in elementary content area textbooks and the extent to which textbooks conformed to these underlying structures, Calfee (1987) and Chambliss (1987a, 1987b) analyzed six elementary social studies textbooks and one science textbook to determine how well-structured the information was. In general, they found the textbooks to be poorly organized. Specifically, they found that it was very unusual for passages or chapters to have a coherent and complete text structure. Both the social studies and science textbooks they analyzed were predominately descriptive, presenting fact after fact about the topic, with the most common descriptive structures tending to be listing and time order. Even more troubling were their findings about functional devices (i.e., elements such as transitions, introductions, and conclusions). In Calfee's words, "Rare was the introduction that actually prepared the reader for what was to come, or the transition that led the reader from one section to another, or the conclusion that summarized the content and drew implications from it" (p. 6).

A number of studies have examined the types of questions provided in commercially published content area materials (Davis & Hunkins, 1965; Elliott et al. 1985; Trachtenberg, 1974). In general, they have reported finding a majority of factual recall questions. The most comprehensive and recent examination is by Armbruster and Ostertag (1987), who analyzed both the instructional questions (i.e., those intended to focus or lead discussion) and assessment questions (i.e., those at the end of chapter or unit test) found in contemporary fourth- and fifth-grade science and social studies series for three publishers along several different dimensions (e.g., level of question, target relationship, source of answer, and form of question). In general, they also revealed that both science and social studies textbooks made use of lower level cognitive questions that required little or no inference, especially for assessment questions. The questions usually required students to search for a straightforward answer in the textbook and provide a concise response. On average, they found instructional questions to be asked for every 30 words of text, while assessment questions to be asked for every 146 words. In conclusion, Armbruster and Ostertag suggest that "the bottom line of the de facto curriculum of textbooks is clear: What really counts is names, definitions, and other facts that can be assessed 'objectively,' and not meaningful learning of 'big ideas,' or higher order critical thinking, or the ability to write extended answers" (p. 15).

We located one study that looked at the suggestions for comprehension instruction in commercially published content area materials. Armbruster and Gudbrandsen (1986) analyzed the suggestions for comprehension instruction provided for students and teachers in the student textbooks and teachers' manuals of five social studies programs at the fourth- and sixth-grade levels. According to the publishers' promotional literature, the programs provided teachers with everything needed for teaching social studies, reading skills included. Armbruster and Gudbrandsen, however, discovered very little comprehension instruction in teachers' editions and student textbooks. Only 3% of the referenced pages contained any kind of information about direct instruction in reading/study skills. What they found instead was an emphasis on application and practice suggestions with ample provisions for students to apply or practice a reading skill without the benefit of instruction in how to do so.

The evolution of elementary content area materials was studied by Chall (1977). She conducted both an objective and subjective analysis of the textbooks, teachers manuals, and workbooks of sixth-grade history textbooks covering a 35-year period--from 1935 to 1970. Her objective analyses revealed increases in the length of the textbooks and the percentage of pages occupied by pictures, illustrations, charts, maps, and graphics. In addition, the preponderance of questions that asked for text-explicit information remained fairly constant across the years. Chall's subjective analyses describe major changes through the years; in particular, the writing style had become less academic, making what she saw as efforts to interest and appeal to the readers' experiences. In her own words, the textbooks had changed "from relatively small books, straightforward and factual, to books that resemble encyclopedias on the

outside and picture magazines on the inside, with illustrations on three out of four pages and a matching, somewhat chatty style" (p. 38).

Secondary materials. Studies focusing on secondary classrooms have shown that textbooks also play a major role in instruction there (Applebee, Langer, & Mullis, 1987; Ratekin, Simpson, Alvermann, & Dishner, 1985; Smith & Feathers, 1983a, 1983b). In fact, Alvermann and Moore (1991) note in their synthesis of textbook use in secondary content classrooms that nearly all descriptions of reading in secondary classrooms include a description of class sets of a single required text being used by students.

Two studies were located that examined the extent to which text structures existed in secondary content area textbooks. The first was by Nila Banton Smith (1964a, 1964b, 1965), who examined over 200 secondary textbooks (Grades 7-12) and identified common text structures (she called them *text patterns*) in literature, science, social studies, and mathematics. It is difficult to tell from Smith's work exactly what text structures existed in textbooks because she does not explicitly define what constituted each structure or indicate how frequently various structures occurred. In addition, it appears that her understanding of *text pattern* is somewhat different from what more recent discussion has called *text structures* (cf. Meyer & Rice, 1984), although there appears to be some overlap.

Fortunately, the more recent analyses by Calfee (1987) and Chambliss (1987a, 1987b) of four secondary social studies textbooks examined the extent to which text structures exist in secondary content area textbooks and the extent to which these textbooks conform to these underlying structures. These analyses have shown that, in general, secondary textbooks tend to be better structured with clearer text patterns and more well-developed functional devices than those used at the elementary level--but not much better.

Finally, no studies were located that examined the types of questions provided in commercially published secondary materials or the types of suggestions provided for comprehension instruction. Even Chall's (1977) analysis of the evolution of secondary content area materials was lacking. While she did analyze the textbooks, teachers manuals, and workbooks of 11th-grade history textbooks, they all came from within the same decade--far too narrow a sample--and did not show any changes worth noting.

Teaching and Learning

Detailed studies describing teaching and learning in the content areas are very recent, most conducted within the last decade. Although the following profile depicts typical uses of reading in the content areas, it is not a universal description. There is variation in the way teachers use reading both within and across subject areas. In general, though, teachers control the types of experiences students have with print. Goodlad (1984) found that teachers dominated almost all interactions about content and organized class activity around whole-group presentations or independent seatwork. Rare were the instances in which researchers observed teachers preparing students for their reading assignments (i.e., providing a purpose, previewing, activating prior knowledge) or providing instruction in how to construct meaning from the text. In postreading discussions, recitations (i.e., a succession of rapid fire, literal questions followed by short answers) were the dominant mode of teacher-student interactions concerning textbook information, instead of extended, indepth discussion of ideas. In the words of Alvermann and Moore (1991), "teachers told students what to read, when to read, and what to do after reading" (p. 969). For this reason, we thought it would be worthwhile to note those studies that specifically examined teaching and learning at the elementary and the secondary levels.

Elementary classrooms. Probably, the most notable collection of studies was conducted by Durkin (1978-1979), who described the behavior of elementary teachers during social studies. In general, she found that teachers almost never prepared students for the reading they were about to engage in, and that they provided virtually no comprehension instruction (i.e., explicit instruction in how to go about

constructing meaning from the text) throughout the school year. Teachers spent the largest portion of their time as interrogators--assessing comprehension--and as assignment-givers--giving, completing, and checking assignments. Sizable amounts of time were also spent in shifting from one activity to the next and in other non-instruction behaviors. In sum, students received little, if any, assistance in learning how to understand and learn from their textbooks.

Neilsen, Rennie, and Connell (1982) attempted to replicate Durkin's study. However, they adopted a broader definition of comprehension instruction than Durkin by creating a category called "non text-based" instruction that included all activities involved in the "presentation of subject-specific information by means other than written text (e.g., lectures, discussions)" (pp. 81-82). They were interested in analyzing instruction that was focused on the text versus that which was not, a distinction they thought was lacking in Durkin's work. They found that teachers spent over half their instructional time focusing on the text; and, like Durkin, discovered virtually no comprehension instruction in social studies classes, even though they had adopted a broader definition of comprehension than had Durkin. The teachers spent the remaining instructional time away from the text, lecturing or discussing information not centered on the textbook.

From these two studies it might seem that elementary teachers are not aware of, interested in, or able to integrate reading instruction/activities into the content areas. Schmidt et al. (1985) found, however, that all the elementary teachers they interviewed professed to favor integration of reading (and/or writing) into the content area curriculum and reported that they did so in their classrooms. In classroom observations, Schmidt et al. found evidence to the contrary; the amount of time in a school day spent on integrated activities ranged from less than 1% to 18%. In sum, Schmidt et al. documented a "creed-deed discrepancy" between teachers beliefs on integrating reading into the curriculum and what they actually do in practice.

Along these same lines, elementary teachers generally do not perceive a single textbook to be the prominent means for delivering content information. In a survey of how elementary and secondary teachers say they use their textbooks, Davey (1988) found a tendency for elementary teachers to give more class time to textbook reading, use different textbooks with different students, change textbooks if students couldn't read them, and provide an overview of the passage more often before giving an assignment than secondary teachers, though not much more. The elementary teachers did not report much reliance on their textbook for lectures. About one third of the teachers said they used their textbook to supplement instruction (i.e., lectures), with another one third using it for student discussions and group work. In sum, Davey found that elementary teachers view their textbooks as instruments to supplement instruction, rather than as the central focus of content learning.

The most recent and comprehensive examination of the content areas in elementary classrooms is by Stodolsky (1988), who observed 39 fifth-grade math and social studies classes taught by 21 teachers in more than a dozen schools. While her study was not directly focused on the uses of reading in the content areas, it directly addresses the subject matter context of which reading--in all its forms--is a part. She looked at a broad range of instructional factors (e.g., content of lessons, forms of instruction, cognitive goals, student responses) and concluded that subject matter was a powerful force in shaping instructional activity. For example, she found social studies instruction to have much greater variety, both within and across classes, than did math instruction (which was very homogeneous). From her observations, she concluded that as material became more challenging, students behaved more *efficiently* and became more engaged.

Instead of confining her inquiry to teacher-student interaction, Stodolsky chose a broader view of classroom activity--the activity structure--as her unit of analysis. She credits this broader view of classroom activity with providing a means to capture the more complex and sophisticated literate and learning activities that were planned, but not necessarily led, by the teacher. As a result, she was able

to find that "higher challenges" (i.e., more complex interactions about content, including those centered on the text) more often than not took place in individual or group work, when a teacher was not directly involved. Teacher-led content learning activities tended to be reduced to the low-level recitations observed by Goodlad (1984).

Stodolsky's findings stand in sharp contrast to previous descriptive studies of American classrooms that have characterized elementary education as composed of teacher-dominated instruction and low-level intellectual activity. She suggests that maybe these earlier descriptive studies overlooked certain elements within the classroom because of the unit of analysis they used.

Secondary classrooms. Research studies that look at how much class time involves reading have taken two perspectives: those that look at (a) how much instruction involves reading and (b) how much independent reading was allowed. From the first perspective, Greenewald and Wolfe (1981) analyzed the lessons of 20 secondary content area teachers and found that about 60% of instruction involved reading. This reading was of a unique nature though, occurring in a "blitzkreig"-like fashion, that is, in bursts of less than 15 seconds per minute (Dolan, Harrison, & Gardner, 1979). These microbursts of reading were mixed with writing, listening, and speaking activities. Several other studies have also documented the various ways in which reading has been used in a supportive, instrumental role rather than in a dominant role (Alvermann, Dillon, O'Brien, & Smith, 1985; Greenewald & Wolfe, 1981; Ratekin et al., 1985).

While it appears that secondary instruction involves some reading, it is very rare to find independent, extended reading of text in secondary classrooms. From this second perspective, Greenewald and Wolfe (1981) found that between 2 and 10% of all class time was spent on independent reading. Goodlad (1984) found that junior high students spent 3% and senior high students 2% of class time reading independently. From both these perspectives, it looks like instructional and independent uses of reading in secondary classrooms do not allow students to engage in extended texts for extended periods of time.

Along this same line, Smith and Feathers' (1983a) classroom observations showed that little reading was assigned. When reading was required, it tended to be an in-class assignment, with homework being that portion of the assignment not completed in class. When interviewed, both students and teachers reported that, on average, between 6 and 10 pages of text reading were required per week. When these interview reports were compared with classroom observations, Smith and Feathers found the page estimations to be a little higher than what they observed teachers actually assigning.

The differences between the observed and perceived prominence that the textbook took as a delivery system of content information are very interesting. Some researchers have observed the text to be the primary source of information (Applebee et al., 1987). Other studies have indicated that the teacher, not the textbook, was the primary source of information (Ratekin et al., 1985; Smith & Feathers, 1983a). An interesting twist to this is from Smith and Feathers' (1983a) interviews with teachers and students about their perceived prominence of the textbook as a source of information. They found that teachers tended to view the text as the most important source of information and themselves as less important than the text. Students, on the other hand, thought the teacher was most important or at least equal to the text as a source of information. When Smith and Feathers asked students about the reliability of information resources, they found no consensus: Some students had more confidence in the text, others had more confidence in the teacher.

With mixed findings about the prominence of the textbook in instruction, it is not surprising that in most classrooms, reading the text is only one of many media (e.g., films, filmstrips, lectures, discussions) used to learn the subject matter (Davey, 1988; Dolan et al., 1979; Ratekin et al., 1985; Smith & Feathers, 1983a, 1983b). When it comes to textbook reading, however, teachers do not think that it could serve as a stand-alone activity for learning content. They often think that reading the text needs to be accompanied by another instructional medium to reinforce the information. Rieck (1977) interviewed

approximately 34 teachers across several content areas, including English, art, science, mathematics, and social studies, and found that they thought "their students would learn better if they were 'told' about subjects rather than getting them involved in reading" (p. 647).

Teachers do very little to prepare students for reading sections of the textbook. Based upon a collection of studies, it was found that secondary teachers rarely engaged students in prereading activities to activate or build prior knowledge (Davey, 1988; Ratekin et al., 1985), to preview important concepts (Davey, 1988; Ratekin, et al., 1985; Smith & Feathers, 1983b), or to provide a purpose for reading (Davey, 1988; Ratekin, et al., 1985; Smith & Feathers, 1983b). Students have reported that teachers rarely suggest the purpose for reading assignments (Rieck, 1977). Vocabulary was usually emphasized in some way, either by being assigned and tested each week or discussed briefly in class (Smith & Feathers, 1983b).

Although almost no time is spent preparing students for reading, a great deal of what happens in the name of reading occurs during and after assigned reading times. To begin with, very little instruction in reading skills and strategies occurs in secondary classrooms, despite the emphasis on integrating such teaching practices into the content curriculum (Alvermann & Moore, 1991). Smith & Feathers (1983b) observed very little assistance in helping students learn how to construct meaning from their textbooks. The three instances they did find were (a) pointing out the organization of a textbook (table of contents, index) early in the school year, (b) briefly discussing fact versus opinion, and (c) briefly discussing bias.

Generally, some class time is allowed for students to complete the assignments that accompany textbook reading (cf. Davey, 1988). Smith and Feathers (1983b) found that worksheets with questions were used most often to focus student reading. Teachers reported that they thought students would not read unless induced to do so, and based on their past experience, they believed that more students were likely to complete the reading assignment if class time was provided and a written assignment (i.e., the worksheet) accompanied the assigned text. Even with these inducements, teachers estimated that only about 50% of the class actually read the assignments (Smith & Feathers, 1983b). A majority of the students interviewed by Rieck (1977) judged that they completed less than half of each reading assignment, and that they read this part very superficially--usually skimming to find answers to worksheet questions. Furthermore, Smith and Feathers observed many students who avoided reading the text entirely by copying answers from others or filling in the worksheet as the teacher reviewed it in class. Other behaviors they observed that detracted from reading were sleeping during class, doing other homework, and doing homework during instruction. In general, Smith and Feathers (1983a) concluded that there was a great deal of apathy during the reading of the text in the secondary content area classrooms they observed.

Analyzing the questions on the worksheets teachers provided, Smith and Feathers (1983b) found that the questions usually followed the order of materials in the textbook and required short answers. The questions predominantly asked about details from the textbook, with about 20 questions for two or three pages of text. Occasionally, a few essay questions were included that required students to write more extended answers, but these only required reiteration of material previously covered in class or in the textbook (i.e., text explicit), not analysis, synthesis, or evaluation of ideas.

Postreading discussions usually centered on the worksheet questions (Smith & Feathers, 1983b). Alvermann (1988a) tried to characterize these discussions in detail by videotaping, observing, and interviewing teachers and students from seven different subject area classes in a 7-12th-grade secondary school. She found that teachers generally asked questions that could be answered literally from the text and required brief responses, sometimes even in the form of one- or two-word choral responses. Nearly all the teachers asked a preponderance of *who*, *what*, or *when* questions, to which they already knew the answers (i.e., "pseudo-questions"). Even those few questions that required students to draw inferences could be answered briefly, sometimes with a simple yes or no. Student responses to teacher questions

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were usually directed to the teacher (not other students), whereby the teacher would usually expand at some length upon the student's response. This teacher feedback often took the form of a minilecture on a piece of the text material (Smith & Feathers, 1983b). At other times, when teachers provided brief feedback, the discussions over the textbook material took the form of rapid fire question-answer drill sessions.

In sum, the classroom interactions observed by both Alvermann (1988a) and Smith and Feathers (1983b) were restricted to the classic triad--teacher initiates a question, student responds, and teacher comments--and turntaking pattern of classroom interaction. Once the worksheets were reviewed/discussed, there was little evidence that the text information was referred to again by either teachers or students, except in test review sessions (Smith & Feathers, 1983a).

The previous discussion has profiled the role of reading in content areas at both the elementary and secondary levels. It is from this profile that we would like to suggest implications, first for both teachers and textbook publishers, then for future descriptive research.

Implications for Practice

Materials

1. Teachers should move beyond the use of a single, commercially produced textbook in the classroom and include multiple supplementary materials (e.g., articles, trade books) of the type students will encounter in the real world. Expanding the types of print students encounter will give students exposure to differing perspectives on the same topic, introduce them to more high-quality subject matter publications, and help create interest in topics within a given content domain.

2. Publishers should reduce the number of questions (both instructional and assessment) in commercially produced textbook series so that only those questions that highlight, reinforce, or assess important content are included. The high number of low-level questions currently in textbooks gives students the wrong perception of what history or science (or any other subject area) is really like--a collection of endless, unconnected facts. Including a few well-selected questions that focus on ideas central to the text might help teachers and students learn to spend reading time thinking about the complete picture of the content, rather than solely on its constituent parts.

3. Teachers and publishers should provide more opportunities for students to write extended answers to questions. Both publishers of commercial materials and teachers need to consider including questions and tasks that allow for more than a brief response. Generally, when students have to think about and write a response that is longer and more involved, they must process the information at a deeper level.

4. Teachers and publishers should include more questions that require students to synthesize, integrate, and evaluate information across extended text. In some ways, these types of questions ask students to think critically about the information they learn from their texts as well as from other sources (e.g., lectures, films). If schools are to prepare students to be citizens in the complex world of tomorrow, as Kearns (1987) argues, then the time to develop the tools for reading critically is today, by asking students questions that require them to perform more complex cognitive acts on the textual information they encounter in school.

5. Teachers and publishers should consider developing and using content materials that possess a higher quality of writing. As has been suggested by Chall (1977) and Stodolsky (1988), students seem to engage in higher level thought when using more difficult materials. Furthermore, to ask higher level questions that provoke students to think more complexly, texts of higher quality are needed. For example, it is probably more difficult to write higher level questions that require extended responses for current social

studies textbooks (which are encyclopedic and poorly organized) than it would be for textbooks that present the ideas, figures, and events of history in a woven tapestry of complex and layered ideas.

Teaching and Learning

1. Teachers should prepare students for the text materials they will read. At both the elementary and secondary levels, class time should be devoted to previewing central ideas, introducing key vocabulary, and activating relevant prior knowledge. Such preparatory activities have been found in numerous studies to improve students' understanding and recall of what they read. Prereading activities are of even more importance when students are burdened with learning from the *inconsiderate* textbooks that are widely used today.

2. Teachers should include instructional assignments that encompass more than the acquisition of discrete bits of information. Alternatives to the traditional worksheets found in classrooms have been suggested by Armbruster and Anderson (1984), Gallagher (1985), Herber (1978), and Vacca (1981).

3. Teachers should share with students the goals for reading in a particular course. Smith & Feathers (1983a, 1983b) found that students were not aware of why teachers were having them engage in certain activities (i.e., read the textbook and answer questions). It seems that an essential ingredient in helping students achieve the academic and social goals of schooling is to inform them about the goals they are expected to achieve, and encourage their input in establishing additional goals. As is indicated by the studies above, the acquisition of domain content has too often become the ultimate goal in the minds of students (and maybe teachers), rather than the use of domain content to achieve and establish other more far-reaching goals.

4. Teachers should avoid redundant presentations of information. As Smith and Feathers (1983a) found, covering the textbook material in a lecture lessens students' need to read. Instead of defusing one of the purposes for having students read, teachers could have students use reading (and writing) with information presented in other ways (e.g., lectures, films) to achieve larger (or other) purposes. McGinley (1989) has studied the combinatorial power of reading and writing on knowledge acquisition and offers some implications for instruction.

5. Teachers should engage students in more liberating discussion of text material. The current method used to discuss text material, recitation, does not appear to engage students in self-directed or higher level knowledge construction. Instead it is a teacher-controlled interrogation of textual trivia that students seem to care very little about, until the test, after which it is soon forgotten and not cared about again. Strategies suggested by O'Flahavan (1990) hold promise for helping teachers structure discussions around textual information that will encourage more student-directed construction of knowledge in a content domain.

6. Teachers should acquaint students with the discourse conventions, assumptions, and modes of thought within disciplines. Using science as an example, Kurland (1983) has argued that unless students are taught to think like scientists (i.e., introduce them to the nature of scientific discussion), they will not be able to critically read scientific text. It is not enough to merely teach vocabulary, provide some background knowledge, and highlight key ideas in the chapter to help them understand the text at hand. In the words of Kurland, in order for students to really learn from content materials, beyond the surface and factual level, they "must have some notion of the assumptions, perspectives, concerns, and structure of ideas within any discipline" (p. 198).

Recommendations for Future Descriptive Research

The first, and most far-reaching recommendation to be drawn from this review is the need to develop and implement a large-scale well-funded effort to describe content area reading practices at both the elementary and secondary levels. At present, we have bits and pieces of the literacy picture. Nowhere was a large-scale existential descriptive effort for content area reading found. We suggest such an implication first because it covers both materials and teaching and learning, and could serve as a vehicle to realize the more specific implications that follow. We think that such an effort would bring about a more complete and complex understanding of the ways reading (and hopefully writing) are used by teachers and students in content area classrooms. In some ways, such an effort might resemble Goodlad's (1984) work as portrayed in *A Place Called School*, although the effort we suggest here would have a more specified focus, namely, the uses of reading in subject matter classes.

The following are our more specific recommendations for research.

Materials

1. Researchers should analyze questions in textbooks across content areas and grades. It would be of interest to know if an analysis of questions such as that completed by Armbruster and Ostertag (1978) would yield the preponderance of lower cognitive level questions in secondary-level texts that they found in elementary-level texts. In addition, it would be of interest to know the types of questions asked across specific content areas, such as the biological sciences (health, biology), physical sciences (chemistry, physics), social sciences (American history, psychology, economics), natural sciences (geography), language arts (English, literature, composition), performing arts (speech, drama, music), visual arts (sketching, painting), industrial arts (woodshop, metal work, auto mechanics), and mathematics (geometry, algebra, calculus). Should it be found that there are systematic differences in the types of questions found in textbooks among grades or between content areas, then such information would be helpful to those who wish to reshape the types of questions provided.

2. Researchers should continue to study the effects of "considerate" text on understanding and remembering. Armbruster (1984) and others (e.g., Baumann & Serra, 1984; Braddock, 1974) have discussed many of the characteristics of text that affect comprehension and learning. Experiments manipulating these characteristics have been insightful in understanding what makes a text more readable and should be continued. The considerateness of texts across grade levels and content areas needs to be examined to determine precisely where improvements are needed in commercially produced materials.

3. Researchers should consider the effect of other features/dimensions of text on understanding and remembering. Recent work by Graves et al. (1988) suggests that other dimensions contribute to a memorable text and are in need of attention--style, verve, and interestingness. Calfee (1987) and Chambliss (1987a, 1987b) have also suggested that characteristics such as interestingness of writing style be examined to determine what effect they have on making a text *considerate*.

Teaching and Learning

1. Researchers should examine how reading is perceived to fit within the larger purpose of a particular content domain. Academic disciplines have developed traditions and ways of thinking over the years, which continue to shape the content and how a learner must come to think about it. In addition, the role of texts and instructional aims has also taken on various functions within disciplines. Therefore, a careful examination of the ways of thinking within and across content areas would serve as a basis for greater understanding and collaboration between those in leadership in a discipline and those interested in content area reading (see Armbruster et al., 1986, for such an effort.)

2. Researchers should conduct even more detailed analyses of how textbooks are used in elementary content area discussion and instruction. Several of the studies discussed above (Alvermann, 1988a) have begun to capture the detailed dimensions of discussion. Several current research efforts have been involved in developing and using ways to analyze the dynamics of classroom interaction. (See Alvermann, 1988b; O'Flahavan, Hartman, & Pearson, 1988; Stodolsky, 1988; Weber & Shake, 1988).

3. Researchers should study how students use content textbooks (and other materials) to learn in situations that are not teacher-led. As suggested by the work of Stodolsky (1988), traditional units of classroom interaction may not capture the range of ways students may actually use texts to learn content information, both in (and possibly out of) school. Her activity structure deserves further consideration as a tool for understanding content learning in classroom contexts.

4. Researchers should explore alternative ways for discussing textbook material which avoid the classic triad--teacher question, student response, teacher feedback. O'Flahavan (1990) has begun to explore an alternative way of discussing textual information.

5. Researchers should look at how both reading and writing are used in the content classrooms. With so much attention focused these days on the reading/writing connection (see Pearson & Tierney, 1984, for a discussion of the similarities), it seems logical to look at both of these tools for learning in the broadened framework of literacy.

Conclusion

The existential description of reading in the content areas presented here provides one benchmark for those who are interested in improving reading as it relates to teaching and learning from materials in the content areas. A more complete and recent portrayal will come only after further descriptions are completed (possibly in the areas outlined above). Fortunately, research is beginning to focus on newer editions of textbooks and more recent classroom practices. It is only from the perspective of these more recent descriptions that we will be able to see whether the conclusions and hypotheses we drew from the earlier research still hold true. From the beginning, our aim has been that this report will contribute to the evolving understanding of content area reading in the schools and to the continuous search for context-sensitive improvements in materials and teaching methods.

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